

CLAIMS

What is claimed is:

1. A digital gyrator, comprising:
 - a digital filter to emulate an inductance on a telephone line serviced by said digital filter, said digital filter being initially settable to a first cutoff frequency;
 - an oscillation checker module to detect an amplitude of oscillation on said telephone line serviced by said digital filter, said oscillation checker module adapted to reset said digital filter to a second cutoff frequency lower than said first cutoff frequency as a function of said detected oscillation level.
2. The digital gyrator according to claim 1, wherein:
 - 15 said gyrator resets said digital filter to a third cutoff frequency after a predetermined period of time after said digital gyrator causes telephone equipment to enter an off-hook condition.
3. The digital gyrator according to claim 2, wherein:
 - 20 said first cutoff frequency is significantly faster than said third cutoff frequency.
4. The digital gyrator according to claim 2, wherein:
 - 25 said predetermined period of time is at least one second.
5. The digital gyrator according to claim 1, wherein:
 - 30 said first cutoff frequency relates to a desired convergence rate when said telephone line is in a pre-charge state.
6. The digital gyrator according to claim 5, wherein:
 - 35 said second cutoff frequency relates to a desired convergence rate after said telephone line is in a steady state.

7. The digital gyrator according to claim 1, wherein:
said second cutoff frequency relates to a desired
convergence rate after said telephone line is in a steady state.

5 8. The digital gyrator according to claim 1, further
comprising:

a digital load line correlation table to correlate values
output from said digital filter into a desired voltage level.

10 9. The digital gyrator according to claim 8, further
comprising:

a codec to convert an output from said digital load line
correlation table into a voltage signal for output to a DAA servicing said
telephone line.

15 10. A method of regulating a signal on a telephone line,
comprising:

digitizing a signal received from said telephone line;
filtering said digitized signal with a digital low pass filter
20 having a first cutoff frequency;
detecting an amplitude of oscillation in said signal at said
telephone line; and
adjusting said digital low pass filter to have a second
cutoff frequency lower than said first cutoff frequency to dampen said
25 detected oscillation if an amplitude of said oscillation indicates an
unstable pre-charge state of said telephone line.

11. The method of regulating a signal on said telephone line according to claim 10, further comprising:

after a pre-charge period of said telephone line, adjusting said digital low pass filter to have a third cutoff frequency relating to a
5 steady state of said telephone line.

12. The method of regulating a signal on said telephone line according to claim 10, wherein:

said first cutoff frequency is approximately 1 Hz.

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13. The method of regulating a signal on said telephone line according to claim 12, wherein:

said second cutoff frequency is approximately 0.1 Hz.

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14. The method of regulating a signal on said telephone line according to claim 10, wherein:

said second cutoff frequency is approximately 0.1 Hz.

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15. Apparatus for regulating a signal on a telephone line,

comprising:

means for digitizing a signal received from said telephone line;

means for filtering said digitized signal with a digital low pass filter having a first cutoff frequency;

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means for detecting an amplitude of oscillation in said signal on said telephone line; and

means for adjusting said digital low pass filter to have a second cutoff frequency lower than said first cutoff frequency to dampen said detected oscillation if an amplitude of said oscillation

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indicates an unstable pre-charge state of said telephone line.

16. The apparatus for regulating a signal on said telephone line according to claim 15, further comprising:

means for adjusting said digital low pass filter after a pre-charge period of said telephone line, to have a third cutoff frequency relating to a steady state of said telephone line.

17. The apparatus for regulating a signal on said telephone line according to claim 15, wherein:

said first cutoff frequency is approximately 1 Hz.

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18. The apparatus for regulating a signal on said telephone line according to claim 17, wherein:

said second cutoff frequency is approximately 0.1 Hz.

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19. The apparatus for regulating a signal on said telephone line according to claim 15, wherein:

said second cutoff frequency is approximately 0.1 Hz.